Comments on
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Part III
Department of the Interior
Fish and Wildlife Service
50 CFR Part 17
Endangered and Threatened Wildlife and Plants: Removing the island night Lizard From the Federal List of Endangered and Threatened Wildlife, Proposed Rule.

The proposed rule on the removing the island night lizard, *Xantusia riversiana*, from threatened status is a thorough and comprehensive review of the biological information on this lizard. I support this proposal. I have some specific comments on the rule as follows:

p. 7911, parag 2. The conclusion that island night lizard reproduction, as reflected by proportion of young lizards in capture samples, is related to rainfall during the year prior to birth is correct. However the figures cited from lizard samples in the rule document are not quite correct, and yearlings should be defined as lizards in their second year of life. A better approach is to refer to Table 6 and Figure 19 in Mautz (2007) and the significant regression of proportions of neonate and yearling numbers on rainfall during the year prior to birth. This rainfall year (August – July) includes the time of females acquiring food resources prior to spring mating, and subsequent gestation.

p. 7914, parag 2. Reference is made to an increase in amount of *Lycium* and *Opuntia* habitat area (favorable to island night lizards) on San Nicolas Island between the 0.52 ha estimate of Fellers et. al. (1998) and 4.6 ha estimate of Juniak (2003). These sheltering shrubs and cacti are slow growing, and the change over 5 years is likely due more to differences in analysis technique and technology available than to actual growth and expansion of the vegetation types. This point is made later in the document (p. 7917, parag 10), but some mention of this possibility should be made at the first description on p 7914, so as to clarify this for the reader.

p. 7914, Table 1. The right hand column on estimated population size has a heading that the units are in millions. This is true for the first entry (21.3), but not for the other two entries. I suggest that the "(million)" in the header be removed, and the first entry either be expressed as "21,300,000" or "21.3 million".

p. 7919, parag. 3. The first sentences imply that the sand dunes on San Nicolas Island formed as a consequence of overgrazing by non-native herbivorous mammals introduced by humans and the effects of overgrazing on erosion. The Dunkle (1950) and Schwartz (1994) references cited are not in the References Cited list for consultation. It is my understanding that the sand dune deposits on San Nicolas and San Clemente Islands were formed during Pleistocene and Recent geological epochs with the rise and fall of sea levels associated with epi-continental glaciation events. That is, they are long standing geologic structures perhaps modified by, but not originating from, non-native grazing mammals introduced to the islands by humans. Parenthetically, all the references cited in the Rule should be checked to confirm that they are listed in the References Cited.

p. 7927, parag. 11. The list of non-native predators identified on San Clemente Island includes "feral cats, black rats, and gopher snakes (*Pituophis catenifer*)…" The sentence implies that "gopher snakes" (plural) are established on San Clemente Island. However there is only one incident of a gopher snake being found on the island and associated with the developed area and site of cargo trafficking from the mainland. This is clarified on the next page (p. 7928, parag 1), but this clarification should be made up front with the list, because the possibility of snake predators is a particularly important threat to island night lizards.

The possibility of snake predators introduced to the islands with island night lizards should receive some further discussion in the Rule. I believe this is the most significant potential introduced predator risk for the lizards, particularly from the California king snake, *Lampropeltis getulus*. There are no native snake species on any of the three islands, San Clemente, San Nicolas, and Santa Barbara Islands, inhabited by island night lizards. Snakes have the capacity to penetrate the retreats that shelter night lizards including beneath surface stones, under matted vegetation, and in crevices in the soil. King snakes in particular are predators on lizards as well as other ground dwelling reptiles and small mammals. Island night lizards have unusually high density populations compared to other mainland lizard species, and thus offer a major food resource to predators that can access them where they take shelter.

p. 7928, parag. 3 and 4. Although the southern alligator lizard and island night lizards may be found in different habitats on San Nicolas Island, I do not see any reason why they would not overlap. Both are secretive and take shelter under stones, in dense vegetation, and soil crevices and have similar diets. In addition to the fact that side blotched lizards are not known to prey on island night lizards, the largest side blotched lizard (about 6 cm snout-vent length for the San Clemente Island population) is too small to take any but the smallest (i.e. newborn) island night lizard. Side blotched lizards generally prey on much smaller arthropods.

p. 7932, parag 3. While most arid habitat lizards that curtail activity during the hottest parts of the day may react to warming climate change with decreased foraging time as suggested by climate modeling by Sinervo *et al*. (2010), this will not be universally so. Lizards at the high latitude or high altitude limits of their range, and thus limited by lower temperatures, could experience the opposite effect at those locations.

It is also noted here in the Rule document that the Sinervo *et al*. (2010) climate change modeling lists for xantusiid lizards, among a very large listing of other lizard species, zero probability of species extinction by year 2080. It is important to note here that this climate modeling is focused on effects of temperature change and a set of thermoregulation physiology parameters of lizard species. The principal goal of this study was to provide evidence that expected warming climate change could put members of the set of lizards, considered as a whole group of animals, at risk of extinction. Probabilities of extinction estimated for individual species or genera in the data set of this modeling are not particularly powerful estimators, because they take into consideration a very narrow aspect of biological factors related to the possibility of extinction from climate change. Included for the family, Xantusiidae, in this study are 4 species in the genus, *Xantusia*, including the

island night lizard. These are characterized as thigmothermic (body temperature determined in large part by substrate temperatures) and thermoconformers (body temperature more variable and lower as opposed to less variable and elevated by basking in sunlight). The island night lizard is exceptional among species of *Xantusia* in experiencing elevation of body temperature by basking (Mautz, W.J. 1994. Thermal biology and microhabitats of xantusiid lizards. P.R. Brown and J.W. Wright, eds. Herpetology of the North American Deserts. Southwestern Herpetologists Society. Van Nuys, CA. 1994). It is notable in this regard that island night lizards are not found under closed canopy stands of trees that shade the ground surface from all direct sunlight. The best habitats are shrublands (for example dominated by *Lycium* and *Opuntia*) that offer a vegetative cover that both shelters the lizards but also provides a mosaic of sun and shade at ground level for basking thermoregulation. The lizards are also presently excluded from habitats that are both very open and exposed and have sandy soil substrate that prevents the lizards from sheltering underground from extreme heat. Elevated temperatures associated with climate change in the form of increased frequency of episodic hot periods (i.e. "heat waves") could restrict island night lizards from their peripheral distribution in habitats with little shelter that the lizards presently occupy.

The more important aspect of climate change scenarios for island night lizards is likely to be changes in rainfall, a variable not addressed in the Sinervo *et al.* (2010) modeling. As noted earlier (commentary reference to p. 7911 above) annual island night lizard reproduction is related to rainfall during the year before birth. While there has not yet been an observation of a drought year or sequence of years resulting in no annual island night lizard reproduction on San Clemente Island, change in rainfall is expected to be the more important environmental weather variable to be considered for sustaining populations of these lizards.